REMARKS/ARGUMENTS

The Pending Claims

Claims 1-4, 16-18, 21, 24, 27, 30, 31, 37, 40, 48, 62, 68-70, 81-88, 91-93, and 96-104 are currently pending. Reconsideration of the pending claims is respectfully requested.

Discussion of the Claim Amendments

Claims 1, 2, 3, 68, 69, and 70 have been amended to define the substituent X in terms of specific chemical structures. Support for these amendments can be found in the present specification at, e.g., paragraphs 0034-0049. Claims 1, 2, 3, 68, 69, and 70 have been further amended to delete the term "heterocycle." Claims 1, 2, 3, 68, 69, and 70 have been additionally amended to recite that Z is a divalent radical of an alkane, an alkene, or an alkyne. Claims 1, 2, 3, 68, 69, and 70 have been further amended to recite additional embodiments for the substituent X. Support for these amendments can be found in the present specification at, e.g., paragraphs 0048 and 0049.

Claim 4 has been amended to delete the naming of the groups recited in parts (a), (b), and (l) thereof. Claim 4 has been further amended to more particularly define the substituents recited therein. Claim 4 has been additionally amended to correct an error in the structure recited for the amino acid-derived group: -N(R')(R")CHRCO$_2$H, by deletion of the R" group so that the structure is now -N(R^9)CHR^{10}CO$_2$H. Support for this amendment can be found in the present specification at, e.g., paragraph 0046. The referenced paragraph describes an "amino acid-derived group" as any substituent that is derived from an amino acid. The structure shown for the group -N(R')(R")CHRCO$_2$H defines a quaternary ammonium compound. One of ordinary skill in the art would recognize that amino acids, as that term is used in the art, do not contain quaternary ammonium groups. Moreover, the structure as shown in paragraph 0046 does not indicate that the nitrogen atom has a positive charge, as a quaternary ammonium group must have.

In addition, the amendments to claims 1-3 and 68-70 which define amino acid-derived groups recite a structure -N(R^9)CHR^{10}CO$_2$H instead of the structure -N(R')(R")CHRCO$_2$H for one of the two amino acid-derived structures set forth, for the foregoing reasons.

Claims 40 and 86 have been further amended to delete the term "cyclohexylalkyl." Claim 81 has been further amended to change OR^9 and SR^{10} to OR and SR, respectively. Claim 81 has been additionally amended to include a substituted phenyl group in the Markush group defining R. Support for this amendment can be found in the present specification at, e.g., paragraph 0040-0041.

Claims 4, 16, 17, 18, 21, 24, 27, 30, 31, 37, 40, 48, 62, 68, 69, 70, 81-88, and 91-93 have been amended to further recite a salt of the compound. Support for these amendments can be found in the present specification at, e.g., paragraph 0057.

Claims 49, 50, 57, 58, 89, 90, 94, and 95 have been canceled without prejudice or disclaimer of subject matter recited therein.

New claims 96-104 have been added and are supported by the specification at, e.g., paragraphs 0128, 0130, 0136, 0151, and Example 10.

No new matter has been added by way of these amendments.

Summary of the Office Action

The Office Action rejects claims 1-4, 16-18, 21, 24, 27, 30, 31, 37, 40, 48-50, 57, 58, 62, 68-70, and 81-95 under 35 U.S.C. § 112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter Applicants regard as their invention. The Office Action also rejects claims 49, 50, 57, 58, 89, 90, 94, and 95 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

Discussion of the Indefiniteness Rejections

The Office Action rejects claims 1-4, 16-18, 21, 24, 27, 30, 31, 37, 40, 48-50, 57, 58, 62, 68-70, and 81-95 under 35 U.S.C. § 112, second paragraph, as allegedly indefinite. In particular, the Office Action asserts that the claims are indefinite on five separate grounds, each of which is separately discussed.

(i) On a first ground, the Office Action alleges that substituents X and Y are defined such that the specific point of attachments of various groups is not specified.

Applicants have amended the claims, in particular, claims 1, 2, 3, 68, 69, and 70, to define the substituents in terms of specific chemical structures that unambiguously specify the structure of the substituents and their specific points of attachment in the compound recited therein. Moreover, the terms "amino acid-derived group" and "phosphorous-containing group" have been replaced with specific chemical structures that unambiguously specify the structures of the aforesaid groups. With respect to the Office Action's assertion that a triphenylphosphonium group needs to have a counter ion present when attached to the rest of the molecule, Applicants respectfully submit that it is well known in the art that a charged functional group present in a neutral molecule must necessarily have a counter ion to the charged functional group in order to render the molecule neutral. Claims 1, 2, 3, 68, 69, and 70 have been accordingly amended to recite a triphenylphosphonium group as $—P^{+}Ph_3\ X^{-}$, wherein X^{-} represents a counter ion to the positively-charged triphenylphosphonium group.

In addition, Applicants point out that when R is cysteine or glutathione, one of ordinary skill in the art will recognize that the S atom of cysteine or glutathione will represent the S atom in the radical "RS—" and will not represent a compound of the formula "RSS—."

(ii) On a second ground, the Office Action alleges that, in the definition of Z, the nature of the heteroatom contained in the alkyl, alkenyl, or alkynyl radical is unspecified. Claims 1, 2, 3, 68, 69, and 70 have been amended to delete the term "heteroatom" as well as the term "carbonyl" such that Z is now a divalent radical of an alkane, an alkene, or an alkyne. Applicants believe that one of ordinary skill in the art would readily understand the definition of Z in the claims as amended.

(iii) On a third ground, the Office Action alleges that the term "substituted" without specifying which substituents are intended is indefinite. Applicants respectfully submit that the presently amended claims clearly specify which substituents can be used.

(iv) On a fourth ground, the Office Action alleges that the term "heterocyclic" is indefinite because the term does not define the ring system (e.g., monocyclic, bicyclic, etc.) and does not define the number and type of heteroatoms present in the heterocyclic ring. Applicants respectfully submit that one of ordinary skill in the art would readily comprehend what is intended by the term "heterocylic," as the term "heterocycle" is defined as a ring of

different types of atoms, i.e., a ring compound having atoms other than carbon in its nucleus (see, e.g., Hackh's Chemical Dictionary, 4th ed., pp. 320-321, J. Grant, editor) (copy provided herewith).

(v) On a fifth ground, the Office Action alleges that claims 49, 89, and 94 are indefinine as to which cells' growth is inhibited and what is accomplished thereby. Claims 49, 89, and 94 have been canceled.

In view of the foregoing, the indefiniteness rejections are moot and should be withdrawn.

Discussion of the Enablement Rejections

The Office Action rejects claims 49, 50, 57, 58, 89, 90, 94, and 95 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement. In particular, the Office Action asserts that the specification fails to enable claims 49, 50, 89, and 94 insofar as the specification fails to teach the subject of treatment, the specific dosage, a specific dosing regimen, the specific route of administration, and do not specify the disease or symptom to be treated. The Office Action further rejects claims 57, 58, 90, and 95 and 95 as failing to comply with the enablement requirement. In particular, the Office Action asserts that the specification fails to enable claims 57, 58, 90, and 95 and 95 insofar as the Office Action implies that the specification fails to demonstrate antiviral activity across a wide range of viruses.

Claims 49, 50, 57, 58, 89, 90, 94, and 95 have been canceled. Accordingly, the enablement rejection of claims 49, 50, 57, 58, 89, 90, 94, and 95 is moot. New claims 96-104 have been added to a recite method of treating cancer in a host comprising administering to a host a compound in an amount effective to treat cancer in the host, wherein the cancer is selected from a specified group.

New claims 96-104 specify that the cancer to be treated is leukemia, non-small cell lung cancer, colon cancer, cancer of the central nervous system, melanoma, ovarian cancer, renal cancer, prostate cancer, or breast cancer. Example 10 of the present specification sets forth experimental data obtained by screening an exemplary compound of the presently

claimed invention against various cancer cell lines associated with leukemia, non-small cell lung cancer, colon cancer, cancer of the central nervous system, melanoma, ovarian cancer, renal cancer, prostate cancer, and breast cancer. As is apparent from the data set forth in Example 10, the inventive compound inhibited the growth of 50% of the cells at a concentration G150 that ranged between 0.3 and 323.6 nM for all of the cell lines tested. Moreover, Example 11 of the present specification sets forth experimental data obtained by screening an exemplary compound of the present invention against various cancer cell lines associated with non-small cell lung cancer, colon cancer, melanoma, ovarian cancer, glioma, and breast cancer in a murine *in vivo* model using various dosing regimens. The inhibitory activity of the inventive compound is expressed as %T/C, or the ratio of cell line growth in treated animals as compared with vehicle-treated control animals expressed as a percentage. As is apparent from the data set forth in Example 11, the inventive compound exhibited a %T/C value ranging from 0 to 38, with several animals being observed as tumor-free after treatment, thereby confirming the *in vivo* anticancer activity of the inventive compound.

Moreover, the present specification teaches that the host to be treated is preferably a human (see, e.g., the present specification at paragraph 0151). In addition, the present specification teaches that the inventive compounds can be administered to a host by any suitable route, for example in the form of an injectable formulation (see, e.g., the present specification at paragraph 0136). One of ordinary skill in the art, in this case an attending physician, will readily understand a host (e.g., a human) can be treated with the inventive compounds at a dose that is for example below a toxic threshold, with the dose adjusted upward if necessary according to the judgment of the attending physician, until a beneficial response is observed. In addition, it is well known in the art that a dosing schedule or regimen can be devised based on an individual host being treated and the response of the host to the dosing schedule.

Thus, Applicants respectfully submit, the present specification enables new claims 96-104, which are directed to treatment of leukemia, non-small cell lung cancer, colon cancer, cancer of the central nervous system, melanoma, ovarian cancer, renal cancer, prostate cancer, and breast cancer. Accordingly, claims 96-104 should not be rejected on this ground.

Conclusion

A favorable decision is soliciated. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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